

2012 LONG-TERM MONITORING DATA SUMMARY REPORT ST. LAWRENCE RIVER REMEDIATION PROJECT

Prepared for

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Long-Term Monitoring Program Objectives.....	1
1.2	Document Organization	2
2	LONG-TERM MONITORING PROGRAM.....	3
2.1	Physical Condition of the Cap (Verification of Cap Presence)	3
2.1.1	Methods	3
2.1.1.1	Underwater Video Survey.....	4
2.1.1.2	Manual Probing Activities	4
2.1.2	Results	4
2.2	Fish Monitoring.....	5
2.2.1	YOY Monitoring	5
2.2.1.1	Methods.....	5
2.2.1.2	Results	6
2.2.2	Adult Fish Monitoring	8
2.2.2.1	Methods.....	8
2.2.2.2	Results	9
2.3	Shoreline Restoration Plantings and Monitoring.....	9
3	SCHEDULE	11
4	REFERENCES	12

List of Tables

Table 2-1	2012 Physical Condition Cap Monitoring Results
Table 2-2	2012 Resident Fish Monitoring – Young-of-Year Spottail Shiner Field Data and PCB Results
Table 2-3	2012 Resident Fish Monitoring – Young-of-Year Spottail Shiner Dibenzofuran Results
Table 2-4	2012 Resident Fish Monitoring – Adult Fish Field Data and PCB Results

List of Figures

- Figure 1-1 Site Overview Map
- Figure 2-1 Physical Condition Cap Monitoring Location – Upstream Portion
- Figure 2-2 Physical Condition Cap Monitoring Location – Downstream Portion
- Figure 2-3 Fish Sample Collection Locations – Background
- Figure 2-4 Fish Sample Collection Locations – Site and Downstream of Site
- Figure 2-5 Young-of-Year PCB Results – 2010 through 2012

List of Appendices

- Appendix A Physical Condition Cap Monitoring Underwater Video Survey
- Appendix B Data Validation Report

ACRONYMS AND ABBREVIATIONS

Alcoa	Alcoa Inc.
Anchor QEA	Anchor QEA, LLC
cm	centimeters
LTMP	Long-Term Monitoring Plan
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
ng/kg	nanograms per kilogram
PCB	polychlorinated biphenyl
QA/QC	quality assurance/quality control
RMC	Reynolds Metals Company
SAV	submerged aquatic vegetation
Site	St. Lawrence River Remediation Project located adjacent to the Alcoa Inc. Massena East Plant in Massena, New York
SLRRP	St. Lawrence River Remediation Project
USEPA	U.S. Environmental Protection Agency
YOY	young-of-year

1 INTRODUCTION

This document presents the results of the Year 3 (2012) long-term monitoring for the St. Lawrence River Remediation Project (SLRRP) located adjacent to the Alcoa Inc. (Alcoa) Massena East Plant (former Reynolds Metals Company [RMC]) in Massena, New York (Site; Figure 1-1). This monitoring was conducted in accordance with the Site Long-Term Monitoring Plan (LTMP; Anchor QEA, LLC [Anchor QEA] and ARCADIS, May 2012a) and the associated LTMP Addendum (Anchor QEA and ARCADIS, September 2012).

1.1 Long-Term Monitoring Program Objectives

As detailed in the LTMP and LTMP Addendum, specific objectives of the program are as follows:

- Verify that the cap armor layer remains intact
- Evaluate trends in young-of-year (YOY) fish tissue concentrations within the remediation area and at an upstream background area
- Document the benthic community present in the capped cells, in a subset of the dredged cells, and at upstream background locations
- Document the sediment quality of the 2009 post-cap habitat layer and surface sediment concentrations in the cells dredged in 2001
- Estimate the presence and density of submerged aquatic vegetation (SAV) within the 2001 and 2009 dredged and capped areas and at upstream background locations
- Assess the survival of the willow and dogwood plantings along the shoreline
- Conduct adult fish monitoring to provide data on fish tissue concentrations at the request of the U.S. Environmental Protection Agency (USEPA)

Monitoring activities that have been conducted to date (2010 to 2012) to satisfy these objectives include the following:

- Monitoring the physical integrity of the cap (i.e., verification of cap presence)
- Fish monitoring (YOY and adult species)
- Benthic community invertebrate survey
- Sediment sampling
- SAV surveying

- Shoreline restoration monitoring

Verification of the presence of the cap, YOY fish collection, and shoreline restoration monitoring activities were initiated in 2010 in accordance with the LTMP; results from these efforts are presented in the 2010 and 2011 Long-Term Monitoring Data Summary Reports (Anchor QEA and ARCADIS, March 2011 and May 2012b). Benthic macroinvertebrate community survey, sediment sampling, and SAV surveying events were initiated in 2011; results from these efforts are presented in the 2011 Long-Term Monitoring Data Summary Report (Anchor QEA and ARCADIS May 2012b). This report presents the results of continued cap physical integrity monitoring and YOY fish monitoring from 2012 as well as adult fish sampling, which was initiated in 2012.

1.2 Document Organization

Details regarding the 2012 long-term monitoring results are provided in Section 2 of this report. Section 3 presents the schedule for future monitoring activities, and references cited as sources for this document are provided in Section 4.

Appendices included with this document present results of the 2012 monitoring events including the physical condition cap monitoring underwater video survey (Appendix A) and the data validation report (Appendix B).

2 LONG-TERM MONITORING PROGRAM

Components of the long-term monitoring program performed in 2012 included the following:

- Physical condition of the cap (i.e., verification of cap presence)
- Fish monitoring
 - YOY monitoring
 - Adult fish monitoring (conducted at the request of USEPA)

Details of the LTMP activities conducted in 2012, including general approach and a discussion of results, are presented in Sections 2.1 through 2.2. Note also that, based on the results of the 2011 shoreline restoration monitoring, several trees were replanted in summer 2012. These shoreline trees were observed in the fall; additional details are provided in Section 2.3.

2.1 Physical Condition of the Cap (Verification of Cap Presence)

Monitoring of the physical integrity of the capped portions of the Site was performed to verify that the armor layer remains intact and continues to protect the chemical isolation layer of the cap and physically isolate the sediments below. The methods utilized for monitoring were selected during development of the LTMP (Anchor QEA and ARCADIS, May 2012a) to provide information on the physical condition and existence of the armor layer of the cap.

2.1.1 Methods

Physical integrity monitoring consisted of cap inspection through underwater video surveying and manual probing. As described in the LTMP, a subset of monitoring locations from the 2009 construction verification program was selected to provide sufficient coverage of the capped areas. A total of 150 locations were spaced across the Site, providing measurements approximately every 1,000 square feet for isolated capping cells and approximately every 2,500 square feet for contiguous cells (Figures 2-1 and 2-2). The locations monitored in 2012 correspond to the same locations monitored in 2011 and 2010. Note that one location could not be accessed in 2012 (C-86-45) due to water depth (i.e.,

water too shallow to access by boat and too deep to safely access via wading); however, visual observations of this location were made as possible. Additionally, one location (D-118-40) that was monitored previously was inadvertently not monitored in 2012; this location will be monitored in 2013.

2.1.1.1 Underwater Video Survey

Visual observations of the cap surface were made at 62 of the monitoring locations utilizing an underwater camera. These locations were selected to provide representative coverage of the cap areas, and they are consistent with the locations observed in 2011. At each location, the video camera was lowered into the water column to a depth near the cap surface, and the lens was rotated to provide a video sweep of the nearby area to assess the presence of the armor layer and/or overlying material.

2.1.1.2 Manual Probing Activities

Manual probing was performed to document that the armor stone remains intact and continues to protect the chemical isolation layer of the cap and physically isolate the sediments below. Probing was conducted in accordance with the protocol described in the LTMP. At each monitoring location, a graduated rod was used to penetrate the habitat material or other native substrate until refusal was met at the armor stone layer. Penetration depth was measured at each location using the probing rod gradations (0.1-foot intervals).

2.1.2 Results

The 2012 physical integrity monitoring confirmed that the cap remains intact with armor stone in place at all of the 2012 long-term monitoring locations, thereby satisfying the objective of the LTMP. This result is consistent with the findings from the 2010 and 2011 monitoring events.

Manual probing and underwater video surveys indicated that habitat material or other native substrate is present at the majority of locations with variable thickness. Thickness measurements from probing indicated an average and median material thickness of approximately 0.30 feet overlaying the armor stone layer of the cap. This is slightly less than the average and median thickness observed in 2011 (approximately 1.0 feet and 0.5 feet,

respectively). As discussed in the SLRRP Work Plan (Anchor QEA and ARCADIS, April 2009), some redistribution of the habitat layer material was anticipated based on the Site's hydrodynamic conditions; the 2011 and 2012 monitoring results confirm that some redistribution has occurred. Appendix A presents the underwater video surveys and Table 2-1 presents the probing results from the 2012 long-term monitoring event.

The 2012 monitoring event was the third monitoring event performed as part of the long-term monitoring program conducted for the SLRRP, with subsequent events scheduled annually until the next 5-year review (i.e., in 2014). Future survey events will be used to confirm the presence of the armor stone and continued protection of the chemical isolation material.

2.2 Fish Monitoring

Resident fish sampling was performed September 10 and 12 to 14, 2012, and October 8 to 12, 2012, at the Site, downstream of the Site, and at an upstream background area, in accordance with the LTMP (Anchor QEA and ARCADIS, May 2012a) and the LTMP Addendum (Anchor QEA and ARCADIS, September 2012). Sampling efforts included the collection of YOY and adult fish; sample locations are shown on Figures 2-3 and 2-4. The objective of the YOY sampling is to evaluate trends in polychlorinated biphenyl (PCB) fish tissue concentrations within the remediation area of the Site and at an upstream background area in the St. Lawrence River. The objective of the adult fish sampling is to provide data on the PCB fish tissue concentrations within the remediation area of the Site, downstream of the Site along the shoreline between the downstream Site boundary and the bridge to Canada, and at an upstream background area in the St. Lawrence River. This was the third YOY fish sampling event (sampling occurred previously in 2010 and 2011) and the first adult fish sampling event.

2.2.1 YOY Monitoring

2.2.1.1 Methods

In accordance with the LTMP, YOY spottail shiners (*Notropis hudsonius*) were targeted from the Site and from a background location upstream of the Robert Moses-Saunders Power Dam in the vicinity of Barnhart Island. Sampling locations are shown on Figures 2-3 and 2-4.

Fish were collected using a boat-mounted electrofishing unit and submitted for analysis of PCB Aroclors and lipids. At the request of USEPA, a subset of samples was also analyzed for dibenzofurans.

Ten whole-body YOY spottail shiner composite samples were collected from the Site remediation area, and five whole-body YOY spottail shiner composite samples were collected from the upstream background area (Figure 2-3). Fish were collected from across the Site and background areas and composited to form the required number of samples. As such, the sample results are representative of fish captured within the sample areas, rather than at individual locations.

Each whole-body YOY spottail shiner sample contained between 15 and 50 individual fish, with fewer fish in samples submitted for PCB analysis only and more fish in samples submitted for both PCB and dibenzofuran analysis. The number of fish, minimum and maximum size range of fish per sample, and the total weight of each sample are presented in Table 2-2.

All YOY spottail shiner samples were packaged in the field and shipped to Pace Analytical (formerly known as Northeast Analytical, Inc.) in Schenectady, New York, for processing and analysis. All whole-body samples were analyzed for PCBs (Aroclor; Method 8082) and lipids, and four samples were also analyzed for dibenzofurans (Method 8290; three from the Site area and one from the background area). Quality assurance/quality control (QA/QC) consisted of one matrix spike (MS) sample and one matrix spike duplicate (MSD) sample prepared by the laboratory. Data validation was performed on the chemistry data, and all data were determined to be usable as reported from the laboratory. A data validation report prepared based on the analytical method and USEPA guidelines is provided in Appendix B.

2.2.1.2 Results

Analytical results for the YOY spottail shiner samples are presented in Table 2-2 for PCBs and Table 2-3 for dibenzofurans. PCB results from the Site ranged from 0.12 to 0.33 milligrams per kilogram (mg/kg) with a mean of 0.23 mg/kg wet weight. Lipid-normalized PCB results ranged from 2.8 to 8.3 mg/kg-lipid with a mean of 4.8 mg/kg-lipid. All

background samples were non-detect for PCBs (at a reporting limit of 0.05 mg/kg). When half the reporting limit of 0.05 mg/kg is used to calculate lipid-normalized values for the PCB results, the range for the background samples was 0.73 to 0.88 mg/kg-lipid with a mean of 0.82 mg/kg-lipid. Of the ten dibenzofuran compounds analyzed for, as presented in Table 2-3, the results for both the Site and upstream background samples were non-detect except for 2,3,7,8-TCDF, which was detected in all samples, including the upstream. The 2,3,7,8-TCDF results ranged from 2.1 to 2.8 nanograms per kilogram (ng/kg) with a mean of 2.5 ng/kg for the Site samples. The background location had detectable 2,3,7,8-TCDF concentrations of 0.58 ng/kg.

PCB concentrations in whole-body YOY spottail shiner samples at the Site in 2012 were approximately half of the concentrations observed in 2011, and approximately a quarter of the concentrations in 2010 (Figure 2-5). Mean wet weight PCB concentrations in 2010 at the Site were 0.92 mg/kg (range of 0.49 to 1.3 mg/kg) compared to 0.41 mg/kg (range of 0.28 to 0.76 mg/kg) in 2011 and 0.23 mg/kg (range of 0.12 to 0.33 mg/kg) in 2012. Lipid-normalized PCB results showed similar declines, with mean concentrations in 2010 at the Site of 24 mg/kg-lipid (range of 11 to 65 mg/kg-lipid) compared to 7.2 mg/kg-lipid in 2011 (range of 4.8 to 12 mg/kg-lipid) and 4.8 mg/kg-lipid (range of 2.8 to 8.3 mg/kg-lipid). PCBs were non-detect in the upstream background area in all sampling years (2010 to 2012).

Dibenzofuran concentrations in whole-body YOY spottail shiner samples at the Site decreased somewhat between years (2010 to 2012) with the lowest concentrations observed in 2012. In all years, 2,3,7,8-TCDF was the only compound detected and was present in all Site and upstream background samples analyzed for dibenzofurans (three Site samples and one background sample each per year). The mean 2,3,7,8-TCDF concentration at the Site in 2010 was 3.5 ng/kg (range of 3.2 to 3.7 ng/kg) compared to 3.3 ng/kg in 2011 (range of 3.1 to 3.5 ng/kg) and 2.5 ng/kg in 2012 (range of 2.1 to 2.8 ng/kg). Background results were similar between years at 0.53 ng/kg in 2010, 0.56 ng/kg in 2011, and 0.58 ng/kg in 2012.

2.2.2 Adult Fish Monitoring

2.2.2.1 Methods

In accordance with the LTMP Addendum (Anchor QEA and ARCADIS, September 2012), adult (greater than or equal to 25 centimeters [cm]) smallmouth bass (*Micropterus dolomieu*), and adult brown bullhead (*Ictalurus nebulosus*) were targeted for collection from the Site, along the southern shoreline between the downstream Site boundary and the bridge to Canada, and from a background location upstream of the Robert Moses-Saunders Dam in the vicinity of Barnhart Island. Sampling locations are shown on Figures 2-3 and 2-4. Based on a discussion with USEPA on September 19, 2012, the sampling reach downstream of the Site was extended beyond the bridge to Canada to the upstream boundary of the Racer-Trust (formerly General Motors) property in order to collect the required number of samples. Fish were collected using a boat-mounted electrofishing unit and gill nets and were submitted for analysis of PCB Aroclors and lipids in edible fillets.

Six individual smallmouth bass and six individual brown bullhead samples were collected from the Site remediation area and the area downstream of the Site. Four individual smallmouth bass, two individual largemouth bass (*Micropterus salmoides*), and six individual brown bullhead samples were collected from the upstream background area (Figure 2-3). In total, 18 adult bass and 18 adult bullhead samples were collected. Largemouth bass were collected at the upstream background area as a substitute species due to limited availability of smallmouth bass at this sampling location. In addition, the upstream background area was expanded further upstream of Barnhart Island in order to fill the required sample size (Figure 2-3).

All samples were packaged in the field and shipped to Pace Analytical in Schenectady, New York, for processing and analysis. All samples were analyzed for PCBs (Aroclor; Method 8082) and lipids in edible fillets. QA/QC consisted of one MS sample and one MSD sample prepared by the laboratory. Data validation was performed on the chemistry data, and all data were determined to be usable as reported from the laboratory. A data validation report prepared based on the analytical method and USEPA guidelines is provided in Appendix B.

2.2.2.2 Results

Analytical PCB results for all smallmouth bass, largemouth bass, and brown bullhead samples are presented in Table 2-4. Smallmouth bass PCB results from the Site ranged from 0.33 to 2.3 mg/kg with a mean of 0.79 mg/kg wet weight. Lipid-normalized PCB results ranged from 11 to 81 mg/kg-lipid with a mean of 31 mg/kg-lipid. Brown bullhead PCB results from the Site ranged from 0.075 to 0.96 mg/kg with a mean of 0.48 mg/kg. Lipid-normalized PCB results ranged from 19 to 73 mg/kg-lipid with a mean of 43 mg/kg-lipid.

Smallmouth bass PCB results from downstream of the Site ranged from non-detect (at a reporting limit of 0.05 mg/kg with half the reporting limit used for calculations) to 0.43 mg/kg with a mean of 0.14 mg/kg. Lipid-normalized PCB results ranged from 1.0 to 37 mg/kg-lipid with a mean of 12 mg/kg-lipid. Brown bullhead sample PCB results from downstream of the Site ranged from non-detect (at a reporting limit of 0.05 mg/kg) to 0.68 mg/kg with a mean of 0.29 mg/kg. Lipid-normalized PCB results ranged from 1.7 to 70 mg/kg-lipid with a mean of 29 mg/kg-lipid.

Smallmouth bass PCB results from the background area ranged from non-detect (at a reporting limit of 0.05 mg/kg with half the reporting limit used for calculations) to 0.28 mg/kg with a mean of 0.10 mg/kg. Lipid-normalized PCB results ranged from 0.74 to 8.7 mg/kg-lipid with a mean of 3.0 mg/kg-lipid. All largemouth bass and brown bullhead background samples were non-detect for PCBs (at a reporting limit of 0.05 mg/kg with half the reporting limit used for calculations). Lipid-normalized values for the largemouth bass background samples ranged from 1.6 to 1.8 mg/kg-lipid with a mean of 1.7 mg/kg-lipid and lipid-normalized values for brown bullhead background samples ranged from 0.71 to 3.9 mg/kg-lipid with a mean of 1.7 mg/kg-lipid.

2.3 Shoreline Restoration Plantings and Monitoring

Due to the plant mortality observed during the 2011 shoreline restoration monitoring, additional plantings were installed along the shoreline in summer 2012. A total of 27 willow (*Salix* sp.) and 42 dogwood (*Cornus alba*) plantings were installed in locations where mortality of these same species from past plantings were observed. In order to increase survivability of the plantings, additional care was taken of the plantings including mulching,

placement of fertilizer, and routine watering. These plantings were observed during fall 2012 to assess their condition; all plantings were observed to be alive at that time. The next shoreline restoration monitoring event will be conducted in 2013, consistent with the LTMP (Anchor QEA and ARCADIS, May 2012a).

3 SCHEDULE

The monitoring plan components that have been or will be performed within the 5-year period after capping completion (i.e., 2010 through 2014) are discussed in the LTMP (Anchor QEA and ARCADIS, May 2012a) and the LTMP Addendum (Anchor QEA and ARCADIS, September 2012). The monitoring results from this 5-year period will be summarized in annual reports and submitted to USEPA to serve as the basis to conduct the required 5-year National Contingency Plan review. It should also be noted that the program components may be adjusted with the approval of USEPA based upon the monitoring results and current status of the Site.

The following summarizes the overall schedule for the monitoring components to be conducted as part of the LTMP. Years 1 through 5 represent the number of years after the completion of capping in 2009.

- Physical condition of the cap: Years 1 through 5
 - Perform late summer to fall for consistency with post-capping measurement following completion of 2009 activities
- Fish monitoring: Years 1, 2, 3, and 5
 - Perform before the end of October
- Benthic community macroinvertebrate survey: Years 2 and 4
 - Year 2 (2011) survey results were generally similar between Site and background and capped versus uncapped cells, but there were enough differences to warrant another round of sampling in Year 4.
 - Perform before the end of October
- Sediment sampling: Years 2 and 4
 - Conduct concurrent with benthic community macroinvertebrate survey
- SAV survey: Years 2 and 4
 - Perform before the end of September
- Shoreline restoration monitoring: Years 1, 2, and 4
 - Perform before the end of September

4 REFERENCES

Anchor QEA, LLC (Anchor QEA) and ARCADIS, 2009. *Work Plan*. St. Lawrence River Remediation Project. Prepared for Alcoa. April.

Anchor QEA and ARCADIS, 2011. *2010 Long-Term Monitoring Data Summary Report*. Prepared for Alcoa. March.

Anchor QEA and ARCADIS, 2012a. *Long-Term Monitoring Plan*. St. Lawrence River Remediation Project. Prepared for Alcoa. May.

Anchor QEA and ARCADIS, 2012b. *2011 Long-Term Monitoring Data Summary Report*. Prepared for Alcoa. May.

Anchor QEA and ARCADIS, 2012. *Long-Term Monitoring Plan Addendum*. St. Lawrence River Remediation Project. Prepared for Alcoa. September.

TABLES

Table 2-1
2012 Physical Condition Cap Monitoring Results

2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

Location ID	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Video (Yes/No)	Description
	Northing	Easting				
A-04-07	2242293.5	428948.3	15.8	0.5	Yes	Sand over gravel over cobble (armor stone present)
A-07-29	2242191.0	428893.7	10.0	0.4	Yes	Sand over gravel over cobble (armor stone present)
A-07-43	2242219.6	428843.1	7.0	0.1	Yes	Sand over cobble (armor stone present)
A-07-52	2242228.7	428888.4	9.8	0.0	No	Cobble (armor stone present)
A-08-25	2242203.8	428934.7	14.7	0.6	No	Sand over cobble (armor stone present)
A-08-46	2242236.4	428927.8	13.5	0.3	Yes	Sand over gravel over cobble (armor stone present)
A-09-17	2242203.3	428979.8	18.1	0.2	Yes	Sand and gravel over cobble (armor stone present)
A-09-39	2242246.9	429000.9	20.7	0.3	Yes	Sand over cobble (armor stone present)
A-09-47	2242239.8	428963.5	19.4	0.2	No	Sand over cobble (armor stone present)
A-14-18	2242301.0	429338.4	16.4	0.4	No	Sand over gravel over cobble (armor stone present)
A-14-22	2242296.2	429319.9	16.0	0.4	No	Sand over cobble (armor stone present)
A-14-31	2242331.0	429337.2	16.4	0.4	No	Sand over gravel over cobble (armor stone present)
A-14-35	2242325.4	429311.0	16.5	0.4	Yes	Sand over gravel over cobble (armor stone present)
A-16-07	2242153.2	428905.7	12.2	0.5	Yes	Sand and gravel over cobble (armor stone present)
A-16-26	2242160.8	428942.9	16.2	0.4	Yes	Sand and gravel over cobble (armor stone present)
A-17-14	2242168.2	428987.9	19.5	0.4	Yes	Sand and gravel over cobble (armor stone present)
A-25-33	2242125.9	428951.6	18.0	0.8	Yes	Sand and gravel over cobble (armor stone present)
A-32-07	2242041.3	428923.4	7.3	0.0	Yes	Cobble (armor stone present)
A-32-34	2242072.3	428944.4	11.0	0.6	No	Sand over cobble (armor stone present)
C-03-18	2242193.9	426935.8	8.1	0.4	No	Sand over gravel over cobble (armor stone present)
C-03-22	2242188.3	426910.5	9.7	0.6	No	Sand over gravel over cobble (armor stone present)
C-03-28	2242223.7	426929.1	10.3	0.4	No	Sand and gravel over cobble (armor stone present)
C-03-32	2242222.0	426902.3	9.1	0.6	Yes	Sand and gravel over cobble (armor stone present)
C-13-18	2242298.1	427424.2	14.0	0.7	Yes	Sand over gravel over cobble (armor stone present)
C-13-22	2242298.2	427406.5	14.3	0.3	No	Sand over cobble (armor stone present)
C-13-29	2242327.8	427394.6	9.9	0.3	No	Sand and gravel over cobble (armor stone present)
C-13-33	2242331.5	427421.2	12.6	0.5	No	Sand and gravel over cobble (armor stone present)
C-15-03	2242319.4	427508.7	12.8	0.4	No	Sand over gravel over cobble (armor stone present)
C-15-10	2242348.4	427503.8	14.1	0.6	No	Sand and gravel over cobble (armor stone present)
C-15-19	2242318.5	427514.1	13.7	0.6	Yes	Sand over gravel over cobble (armor stone present)
C-15-24	2242352.1	427524.6	15.1	0.7	No	Sand and gravel over cobble (armor stone present)
C-18-20	2242146.4	426859.7	8.2	0.0	Yes	Cobble (armor stone present)
C-21-17	2242185.0	427008.4	10.8	0.3	Yes	Sand over cobble (armor stone present)
C-23-10	2242203.6	427104.7	7.7	0.2	Yes	Sand over cobble (armor stone present)
C-24-10	2242213.6	427152.2	11.6	0.3	Yes	Sand over gravel over cobble (armor stone present)
C-27-10	2242247.6	427298.0	7.2	0.3	Yes	Sand over cobble (armor stone present)
C-28-10	2242258.2	427349.0	9.1	0.0	Yes	Cobble (armor stone present)
C-31-01	2242269.0	427487.3	7.0	0.0	No	Cobble (armor stone present)
C-31-07	2242273.6	427520.3	9.8	0.2	Yes	Sand over cobble (armor stone present)
C-31-12	2242300.9	427515.1	10.9	0.6	No	Sand over gravel over cobble (armor stone present)
C-31-19	2242291.5	427477.9	5.5	0.0	No	Cobble (armor stone present)
C-36-15	2242095.2	426845.1	8.1	0.2	No	Sand over cobble (armor stone present)
C-37-11	2242114.5	426893.1	10.0	0.2	Yes	Sand over cobble (armor stone present)
C-38-18	2242122.6	426945.9	12.2	0.3	No	Sand over cobble (armor stone present)
C-39-23	2242132.7	426991.6	11.0	0.3	Yes	Sand over gravel over cobble (armor stone present)
C-41-27	2242148.3	427084.6	8.7	0.3	No	Sand over gravel over cobble (armor stone present)
C-42-20	2242155.4	427141.1	4.3	0.3	Yes	Sand over cobble (armor stone present)
C-43-11	2242170.3	427199.3	10.0	0.5	No	Sand over cobble (armor stone present)
C-44-17	2242183.0	427241.0	13.1	0.3	Yes	Sand over cobble (armor stone present)
C-45-11	2242194.7	427291.8	7.0	0.0	No	Cobble (armor stone present)
C-46-18	2242201.6	427343.4	6.2	0.3	Yes	Sand over cobble (armor stone present)
C-49-02	2242225.0	427501.3	12.4	0.1	Yes	Sand over cobble (armor stone present)
C-49-08	2242217.5	427474.5	12.7	0.4	No	Gravel over cobble (armor stone present)
C-49-15	2242248.1	427470.1	11.6	1.0	No	Sand over gravel over cobble (armor stone present)
C-49-25	2242245.7	427489.4	11.0	0.7	No	Sand over cobble (armor stone present)
C-52-06	2242265.5	427624.4	14.0	0.0	No	Cobble (armor stone present)
C-52-23	2242271.4	427655.6	15.0	0.3	Yes	Gravel over cobble (armor stone present)
C-53-11	2242277.1	427685.1	17.2	0.5	No	Sand and gravel over cobble (armor stone present)
C-60-19	2242118.0	427123.8	6.5	0.6	Yes	Sand over cobble (armor stone present)
C-61-18	2242124.0	427165.8	3.5	0.4	No	Sand over cobble (armor stone present)
C-62-15	2242138.0	427231.2	9.2	0.3	Yes	Sand over cobble (armor stone present)
C-63-22	2242147.6	427268.1	8.3	0.3	No	Sand over cobble (armor stone present)
C-64-18	2242156.2	427324.0	7.7	0.1	Yes	Sand over cobble (armor stone present)
C-65-09	2242164.7	427368.4	5.2	0.1	No	Sand over cobble (armor stone present)
C-68-07	2242192.2	427526.9	11.3	0.3	Yes	Sand over cobble (armor stone present)
C-68-11	2242208.2	427520.9	11.5	0.5	No	Sand over cobble (armor stone present)

Table 2-1
2012 Physical Condition Cap Monitoring Results

2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

Location ID	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Video (Yes/No)	Description
	Northing	Easting				
C-68-27	2242188.6	427508.2	10.0	0.3	No	Sand over cobble (armor stone present)
C-68-31	2242209.6	427509.8	11.2	0.4	No	Sand over gravel over cobble (armor stone present)
C-75-45	2242074.6	427163.6	1.6	0.0	No	Cobble (armor stone present)
C-76-43	2242074.4	427210.8	2.3	0.2	Yes	Sand over cobble (armor stone present)
C-77-20	2242087.5	427257.0	2.8	0.3	No	Sand over cobble (armor stone present)
C-78-25	2242102.3	427309.2	2.4	0.0	Yes	Cobble (armor stone present)
C-79-08	2242117.1	427357.1	6.3	0.4	No	Sand over cobble (armor stone present)
C-80-07	2242121.0	427410.4	6.1	0.5	Yes	Sand over cobble (armor stone present)
C-86-45	Field personnel were unable to reach location C-86-45 by boat and visually noted presence of armored stone in the area.					
D-15-12	2242409.6	427000.0	14.2	0.0	No	Cobble (armor stone present)
D-15-18	2242410.4	427028.6	9.2	0.3	Yes	Sand over cobble (armor stone present)
D-15-31	2242383.4	427004.1	15.2	0.3	No	Sand over gravel over cobble (armor stone present)
D-15-38	2242393.1	427026.0	11.5	0.5	No	Sand over cobble (armor stone present)
D-17-07	2242439.9	427136.1	8.3	0.5	No	Sand over cobble (armor stone present)
D-17-14	2242407.1	427147.1	10.2	0.7	Yes	Sand over cobble (armor stone present)
D-17-39	2242415.5	427173.8	11.2	0.0	No	Cobble (armor stone present)
D-17-46	2242445.5	427170.9	10.6	0.1	No	Sand over cobble (armor stone present)
D-21-14	2242464.4	427419.8	8.0	0.0	No	Cobble (armor stone present)
D-21-22	2242496.3	427405.1	8.1	0.2	No	Sand over cobble (armor stone present)
D-21-39	2242472.5	427447.6	11.4	0.1	Yes	Sand over cobble (armor stone present)
D-21-46	2242504.2	427442.9	8.4	0.4	No	Sand over cobble (armor stone present)
D-25-07	2242560.6	427686.7	13.7	0.1	Yes	Sand over cobble (armor stone present)
D-25-14	2242528.5	427690.6	10.2	0.3	No	Sand over cobble (armor stone present)
D-25-39	2242533.6	427728.4	9.8	0.0	Yes	Cobble (armor stone present)
D-25-46	2242564.3	427715.5	13.1	0.2	No	Sand over cobble (armor stone present)
D-41-13	2242351.4	426973.8	14.5	0.0	No	Cobble (armor stone present)
D-41-26	2242361.7	427006.5	16.8	0.4	Yes	Sand over cobble (armor stone present)
D-41-36	2242315.0	426976.4	12.5	0.3	No	Sand over cobble (armor stone present)
D-41-46	2242325.1	427005.6	15.3	0.2	No	Sand over cobble (armor stone present)
D-46-06	2242403.4	427322.7	13.0	0.6	No	Sand over gravel over cobble (armor stone present)
D-46-24	2242409.0	427353.9	12.1	0.6	Yes	Sand over gravel over cobble (armor stone present)
D-46-47	2242430.0	427351.5	10.2	0.0	Yes	Cobble (armor stone present)
D-46-61	2242422.9	427321.1	12.3	0.2	Yes	Sand over gravel over cobble (armor stone present)
D-61-13	2242185.4	426469.1	26.2	0.3	Yes	Sand over cobble (armor stone present)
D-61-18	2242186.2	426499.9	22.0	0.0	No	Cobble (armor stone present)
D-61-42	2242153.0	426478.3	22.2	0.1	No	Gravel over cobble (armor stone present)
D-61-47	2242154.5	426510.8	19.7	0.0	No	Cobble (armor stone present)
D-68-03	2242262.5	426948.5	10.0	0.3	No	Sand over cobble (armor stone present)
D-68-27	2242281.9	426953.1	11.0	0.2	No	Sand over cobble (armor stone present)
D-68-47	2242270.0	426983.6	10.9	0.3	No	Sand over cobble (armor stone present)
D-68-51	2242292.0	426978.3	12.9	0.0	Yes	Cobble (armor stone present)
D-80-15	2242432.2	427777.4	9.2	0.2	No	Sand over cobble (armor stone present)
D-80-33	2242433.4	427818.0	9.8	0.0	Yes	Cobble (armor stone present)
D-80-48	2242462.5	427778.4	9.6	0.2	No	Sand over cobble (armor stone present)
D-80-62	2242471.0	427807.5	9.0	0.0	No	Cobble (armor stone present)
D-82-03	2242467.9	427910.1	12.3	0.3	No	Sand over cobble (armor stone present)
D-82-22	2242471.9	427942.1	10.3	0.3	Yes	Sand and gravel over cobble (armor stone present)
D-82-44	2242502.7	427950.3	11.5	0.0	No	Cobble (armor stone present)
D-82-58	2242494.0	427906.0	11.3	0.3	No	Sand over gravel over cobble (armor stone present)
D-91-18	2242180.4	426726.6	9.7	0.2	No	Sand and gravel over cobble (armor stone present)
D-91-23	2242183.9	426747.9	10.5	0.3	No	Sand and gravel over cobble (armor stone present)
D-91-48	2242155.9	426733.1	10.5	0.5	Yes	Sand and gravel over cobble (armor stone present)
D-91-55	2242161.0	426761.7	7.8	0.3	No	Sand and gravel over cobble (armor stone present)
D-93-10	2242353.5	427693.0	10.5	0.5	No	Sand over gravel over cobble (armor stone present)
D-93-26	2242396.7	427711.2	8.2	0.3	No	Gravel over cobble (armor stone present)
D-93-33	2242386.8	427688.8	14.7	0.5	No	Sand and gravel over cobble (armor stone present)
D-93-52	2242363.8	427721.9	8.1	0.3	Yes	Sand over gravel over cobble (armor stone present)
D-110-15	2242351.5	427978.7	13.5	0.5	Yes	Sand and gravel over cobble (armor stone present)
D-110-33	2242348.9	427944.8	15.0	0.6	No	Sand and gravel over cobble (armor stone present)
D-110-44	2242372.3	427948.1	16.5	0.3	Yes	Sand and gravel over cobble (armor stone present)
D-110-58	2242378.7	427973.1	14.2	0.0	No	Cobble (armor stone present)
D-112-19	2242397.5	428086.4	18.9	0.2	Yes	Sand over gravel over cobble (armor stone present)
D-117-08	2242233.3	427713.1	5.0	0.0	No	Cobble (armor stone present)
D-117-09	2242271.0	427740.5	14.2	0.3	No	Sand over cobble (armor stone present)
D-117-20	2242242.8	427752.0	4.5	0.0	Yes	Cobble (armor stone present)
D-117-21	2242266.8	427713.1	15.4	0.2	No	Sand over cobble (armor stone present)

Table 2-1
2012 Physical Condition Cap Monitoring Results
2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

Location ID	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Video (Yes/No)	Description
	Northing	Easting				
D-118-04	2242246.3	427783.1	7.6	0.2	Yes	Sand over cobble (armor stone present)
D-118-19	2242290.3	427806.5	12.3	0.3	No	Sand over cobble (armor stone present)
D-118-23	2242262.8	427824.7	9.0	0.3	No	Sand over cobble (armor stone present)
D-121-11	2242298.6	428020.9	14.0	0.5	Yes	Sand over gravel over cobble (armor stone present)
D-121-15	2242325.2	427985.1	9.1	0.4	No	Sand over cobble (armor stone present)
D-121-22	2242327.6	428012.9	9.5	0.4	No	Sand over cobble (armor stone present)
D-121-43	2242292.2	427986.6	5.0	0.0	Yes	Cobble (armor stone present)
D-123-08	2242340.8	428117.3	16.5	0.3	Yes	Sand over gravel over cobble (armor stone present)
D-123-51	2242349.5	428165.0	11.5	0.4	Yes	Sand over gravel over cobble (armor stone present)
D-124-13	2242355.0	428205.3	12.5	0.6	Yes	Sand over gravel over cobble (armor stone present)
D-125-12	2242368.6	428252.8	11.5	0.4	No	Sand over cobble (armor stone present)
D-125-29	2242376.6	428282.2	11.5	0.2	Yes	Sand over cobble (armor stone present)
D-126-36	2242262.6	427971.5	1.2	0.1	Yes	Sand over cobble (armor stone present)
D-126-45	2242233.2	427983.4	4.8	0.3	No	Gravel over cobble (armor stone present)
D-126-75	2242238.4	428010.4	12.6	0.2	No	Sand and gravel over cobble (armor stone present)
D-126-80	2242262.6	428006.4	12.0	0.3	No	Gravel over cobble (armor stone present)
D-143-06	2242384.6	428321.4	11.0	0.2	No	Sand over cobble (armor stone present)
D-143-22	2242386.1	428359.0	11.1	0.2	Yes	Gravel over cobble (armor stone present)

Notes:

1. Coordinates are based on the North American Datum of 1983, New York East Zone, US Survey Foot.
2. Underwater video coverage provided on DVD in Appendix A.
3. Locations are shown on Figures 2-1 and 2-2.
4. One location (D-118-40) was inadvertently not monitored in 2012 that was monitored previously; this location will be monitored in 2013.

Table 2-2
2012 Resident Fish Monitoring - Young-of-Year Spottail Shiner Field Data and PCB Results

2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

Species	Sample Area	Sample ID	Date Collected	Fish per Sample	Length Range (cm)	Weight (g)	Lipid (percent)	PCB (mg/kg wet)	PCB (mg/kg-lipid)
Site	Spottail Shiner	FS7-1256-SS	10/8/12	45	5.0 - 6.5	63	5.64	0.33	5.8
		FS7-1257-SS	10/8/12	39	4.5 - 6.5	57	5.13	0.30	5.9
		FS7-1258-SS	10/8/12	50	3.5 - 6.5	60	5.37	0.25	4.7
		FS7-1259-SS	10/8/12	17	5.2 - 6.3	24	3.57	0.30	8.3
		FS7-1260-SS	10/8/12	15	5.3 - 6.5	22	4.75	0.29	6.0
		FS7-1261-SS	10/8/12	16	5.1 - 6.5	22	4.63	0.16	3.5
		FS7-1262-SS	10/8/12	17	4.1 - 6.5	22	3.46	0.12	3.5
		FS7-1263-SS	10/8/12	16	4.2 - 6.5	22	5.45	0.15	2.8
		FS7-1264-SS	10/8/12	16	5.0 - 6.5	20	4.91	0.16	3.2
		FS7-1265-SS	10/9/12	17	4.9 - 6.5	23	4.56	0.21	4.6
Background		FS8-1243-SS	9/14/12	25	5.5 - 6.2	35	2.83	ND (0.05)	0.88
		FS8-1244-SS	9/14/12	25	5.6 - 6.3	40	3.29	ND (0.05)	0.76
		FS8-1245-SS	9/14/12	25	5.7 - 5.9	40	2.86	ND (0.05)	0.87
		FS8-1246-SS	9/14/12	25	5.2 - 6.5	39	3.41	ND (0.05)	0.73
		FS8-1247-SS	9/14/12	50	5.5 - 6.2	79	3.00	ND (0.05)	0.83

Notes:

1. Approximate sample collection locations are shown on Figures 2-3 and 2-4.
2. Additional fish were collected for FS7-1256-SS, FS7-1257-SS, FS7-1258-SS, and FS8-1247-SS as these composite samples were analyzed for PCBs and dibenzofurans (see Table 2-3).
3. cm = centimeter
4. g = gram
5. mg/kg wet = milligrams per kilogram wet weight
6. mg/kg-lipid = milligrams per kilogram lipid normalized; half the detection limit was used for calculating lipid-normalized PCB concentrations for non-detect samples
7. ND = non-detect; the value in parenthesis is the associated reporting limit

Table 2-3
2012 Resident Fish Monitoring - Young-of-Year Spottail Shiner Dibenzofuran Results

2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

Species	Spottail Shiner			
Sample Area	Site			Background
Sample ID	FS7-1256-SS	FS7-1257-SS	FS7-1258-SS	FS8-1247-SS
Collection Date	10/8/12	10/8/12	10/8/12	9/14/12
2,3,7,8-TCDF (ng/kg)	2.8	2.7	2.1	0.58
1,2,3,7,8-PeCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
2,3,4,7,8-PeCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2,3,4,7,8-HxCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2,3,6,7,8-HxCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
2,3,4,6,7,8-HxCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2,3,7,8,9-HxCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2,3,4,6,7,8-HpCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2,3,4,7,8,9-HpCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
OCDF (ng/kg)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)

Notes:

1. Approximate sample locations are shown on Figures 2-3 and 2-4.
2. ng/kg = nanograms per kilogram
3. ND = non-detect; the value in parenthesis is the associated reporting limit

Table 2-4
2012 Resident Fish Monitoring - Adult Fish Field Data and PCB Results

2012 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project, Massena, New York

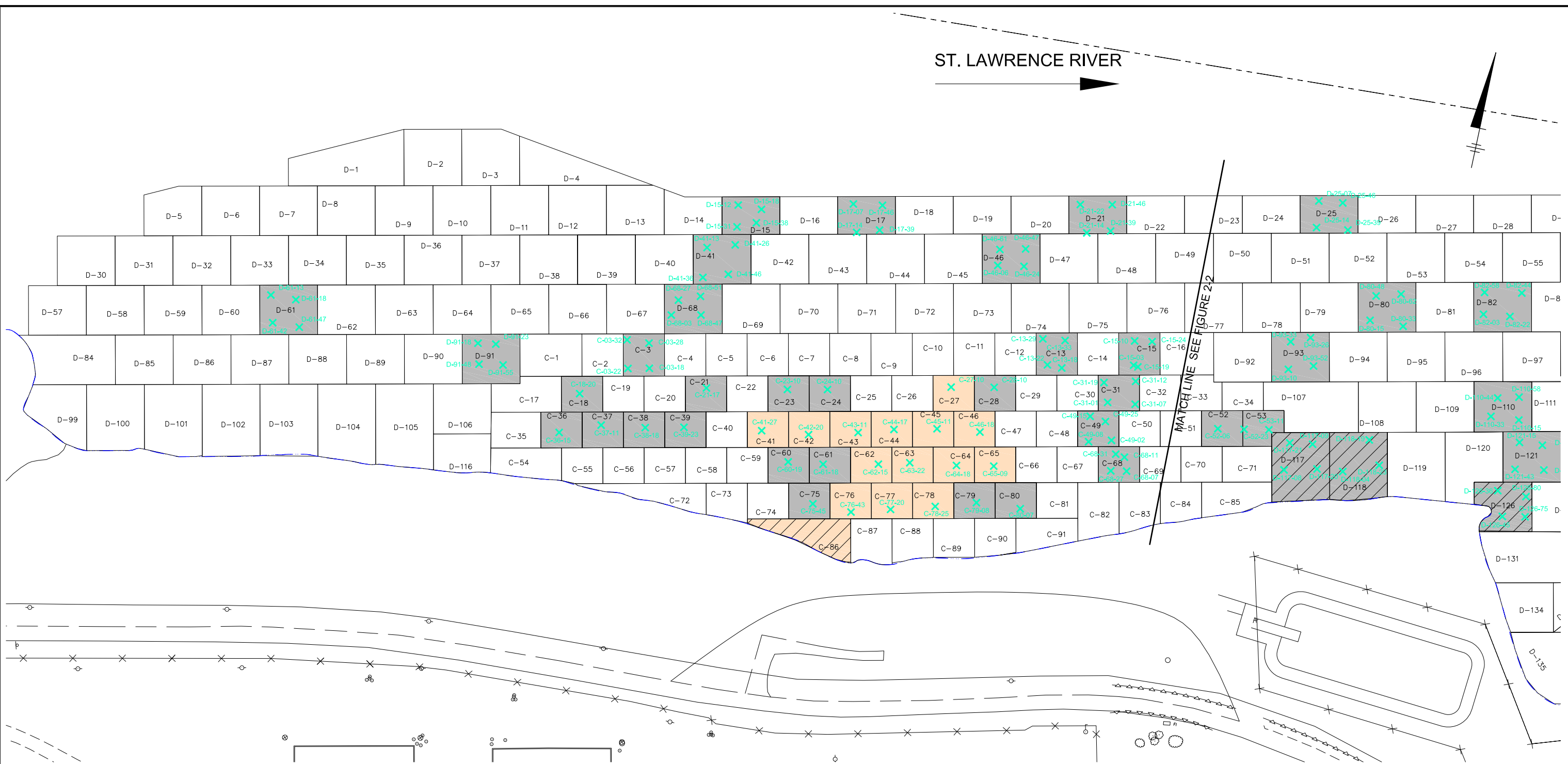
Sample Area	Species	Sample ID	Date Collected	Length (cm)	Weight (g)	Lipid (percent)	PCB (mg/kg wet)	PCB (mg/kg-lipid)
Background	Smallmouth bass	FS8-1292-SB	10/11/12	44.0	1861	5.48	0.05	1.0
		FS8-1293-SB	10/11/12	44.6	1934	3.35	0.05	1.6
		FS8-1294-SB	10/11/12	41.1	1311	3.40	ND (0.05)	0.74
		FS8-1295-SB	10/11/12	47.5	1942	3.19	0.28	8.7
	Largemouth bass	FS8-1296-LB	10/11/12	38.2	1006	1.42	ND (0.05)	1.8
		FS8-1297-LB	10/11/12	40.0	1065	1.58	ND (0.05)	1.6
	Brown bullhead	FS8-1286-BB	10/9/12	34.8	737	1.53	ND (0.05)	1.6
		FS8-1287-BB	10/9/12	27.4	294	1.05	ND (0.05)	2.4
		FS8-1288-BB	10/9/12	28.7	396	2.85	ND (0.05)	0.88
		FS8-1289-BB	10/9/12	26.6	235	0.65	ND (0.05)	3.9
		FS8-1290-BB	10/9/12	32.1	601	3.52	ND (0.05)	0.71
		FS8-1291-BB	10/9/12	31.6	600	2.89	ND (0.05)	0.87
Site	Smallmouth bass	FS7-1197-SB	9/12/12	36.5	852	2.03	0.74	37
		FS7-1198-SB	9/12/12	40.1	910	2.05	0.33	16
		FS7-1199-SB	9/12/12	34.8	728	2.52	0.38	15
		FS7-1200-SB	9/12/12	44.8	1426	2.88	2.32	81
		FS7-1201-SB	9/12/12	46.5	1572	2.32	0.60	26
		FS7-1202-SB	9/12/12	42.8	1408	3.41	0.38	11
	Brown bullhead	FS7-1203-BB	9/12/12	34.7	535	1.74	0.33	19
		FS7-1204-BB	9/12/12	26.5	241	0.38	0.10	27
		FS7-1205-BB	9/12/12	32.4	470	1.40	0.96	69
		FS7-1206-BB	9/12/12	31.8	455	0.33	0.075	23
		FS7-1207-BB	9/12/12	33.0	488	0.96	0.70	73
		FS7-1208-BB	9/12/12	35.0	731	1.49	0.71	47
Downstream	Smallmouth bass	FS9-1266-SB	10/9/12	44.7	1469	1.16	0.43	37
		FS9-1267-SB	10/9/12	42.9	1604	2.60	ND (0.05)	1.0
		FS9-1268-SB	10/9/12	38.5	1279	2.62	ND (0.05)	1.0
		FS9-1269-SB	10/9/12	28.0	382	1.34	0.15	11
		FS9-1270-SB	10/9/12	29.7	446	1.22	0.20	17
		FS9-1271-SB	10/9/12	26.1	248	0.59	ND (0.05)	4.2
	Brown bullhead	FS9-1209-BB	9/13/12	27.8	252	1.61	0.36	22
		FS9-1272-BB	10/9/12	36.0	818	1.14	0.17	15
		FS9-1273-BB	10/9/12	33.9	562	1.51	ND (0.05)	1.7
		FS9-1274-BB	10/9/12	28.8	309	0.61	0.42	70
		FS9-1275-BB	10/9/12	32.1	453	1.62	0.05	3
		FS9-1285-BB	10/9/12	36.0	769	1.07	0.68	64

Notes:

1. Approximate sample locations are shown on Figures 2-3 and 2-4
2. Two largemouth bass were collected as substitute species due to limited availability of smallmouth bass at the upstream background (samples FS8-1296-LB and FS8-1297-LB).
3. cm = centimeter
4. g = gram
5. mg/kg wet = milligrams per kilogram wet weight
6. mg/kg-lipid = milligrams per kilogram lipid normalized; half the detection limit was used for calculating lipid-normalized PCB concentrations for non-detect samples
7. ND = non-detect; the value in parenthesis is the associated reporting limit

FIGURES

CITY: SYRACUSE DM/GROUP: ENVCAD DB: L. FORAKER T. RITSCHL L. FORAKER LD: PIC: H. VANDEWALKER PM: H. VANDEWALKER TW: S. HILL LVR: ON=OFF=REF-
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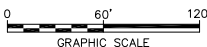


LEGEND:

- APPROXIMATE SHORELINE
- 2001 SLRRP REMEDIATION AREA
- CELLS EXCAVATED DURING 2009 SLRRP ACTIVITIES PRIOR TO CAP PLACEMENT
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PAH CAP
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PCB CAP
- × SURVEYED 2012 PHYSICAL CONDITION CAP MONITORING LOCATIONS

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THEW ASSOCIATES, PLLC, DATED 2004 AND 2006.
2. SELECT 2009 POST-ARMOR SURVEY LOCATIONS AND COORDINATES WERE TARGETED FOR THE 2012 PHYSICAL CONDITION CAP MONITORING EFFORTS.



ST. LAWRENCE RIVER REMEDIATION PROJECT
MASSENA, NEW YORK

PHYSICAL CONDITION
CAP MONITORING LOCATION -
UPSTREAM PORTION



FIGURE
2-1

CITY: SYRACUSE DM/GROUP: ENVCAD DB: L. FORAKER T. RITSCHHELL FORAKER LD: PIC: H. VANDEWALKER PM: H. VANDEWALKER TW: S. HILL LVR: ON=OFF=REF-
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LEGEND:

- APPROXIMATE SHORELINE
- 2001 SLRRP REMEDIATION AREA
- CELLS EXCAVATED DURING 2009 SLRRP ACTIVITIES PRIOR TO CAP PLACEMENT
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PAH CAP
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PCB CAP
- SURVEYED 2012 PHYSICAL CONDITION CAP MONITORING LOCATIONS

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THEW ASSOCIATES, PLLC. DATED 2004 AND 2006.
2. SELECT 2009 POST-ARMOR SURVEY LOCATIONS AND COORDINATES WERE TARGETED FOR THE 2012 PHYSICAL CONDITION CAP MONITORING EFFORTS.

ST. LAWRENCE RIVER

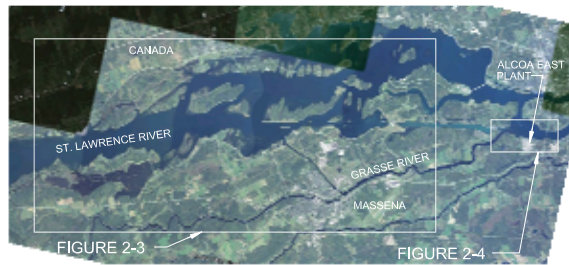
ST. LAWRENCE RIVER REMEDIATION PROJECT
MASSENA, NEW YORK

**PHYSICAL CONDITION
CAP MONITORING LOCATION -
DOWNSTREAM PORTION**



FIGURE
2-2

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: L, FORAKER T, RITSCHER L, FORAKER LD: PIC: H, VANDEWALKER PMS: H, VANDEWALKER TWS: S, HILL LYS: ON=OFF=REF= GAENVCAD/SYRACUSE/ACT/001/0878/2012/00001/DWG/2012/TMDSR/10878G03.DWG LAYOUT: 2-3 SAVED: 12/12/2012 2:48 PM ACADVER: 18.1S (LMS TECH) PAGES: 1 OF 1 PLOT: 12/12/2012 2:48 PM BY: SAWYER, NANCY



LEGEND:

- APPROXIMATE YOUNG-OF-YEAR SPOTTAIL SHINER MONITORING LOCATION
 - APPROXIMATE 2012 ADULT FISH MONITORING LOCATIONS
- FS8-1290-BB SAMPLE IDENTIFICATION NUMBER

FISH SPECIES ABBREVIATIONS:

- BB = BROWN BULLHEAD
- SB = SMALLMOUTH BASS
- LB = LARGEMOUTH BASS

NOTE:

1. AERIAL PHOTO OBTAINED FROM GOOGLE EARTH

ST. LAWRENCE RIVER REMEDIATION PROJECT
MASSENA, NEW YORK

FISH SAMPLE COLLECTION LOCATIONS -
BACKGROUND



FIGURE
2-3

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: L, FORAKER T, RITSCHER L, FORAKER LD: PIC: H, VANDEWALKER PM: H, VANDEWALKER TW: S, HILL LVR: ON=OFF=REF
G:\ENVCAD\SYRACUSE\ACT\B001\0878\2012\00001\DWG\2012\TMSR\10878\G02.DWG LAYOUT: 2-4 SAVED: 12/12/2012 2:52 PM ACADVER: 18.1S (LMS TECH) PAGES: 1 OF 1 PLOT SETUP: --- PLOT STYLE TABLE: PLT\FULLCTB PLOTTED: 12/12/2012 2:54 PM BY: SAWYER, NANCY

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PROJECTNAME: ---

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FIGURE 2-3

FIGURE 2-4

ALCOA EAST PLANT

ST. LAWRENCE RIVER

GRASSE RIVER

MASSENA

CANADA

FIGURE 2-3

FIGURE 2-4

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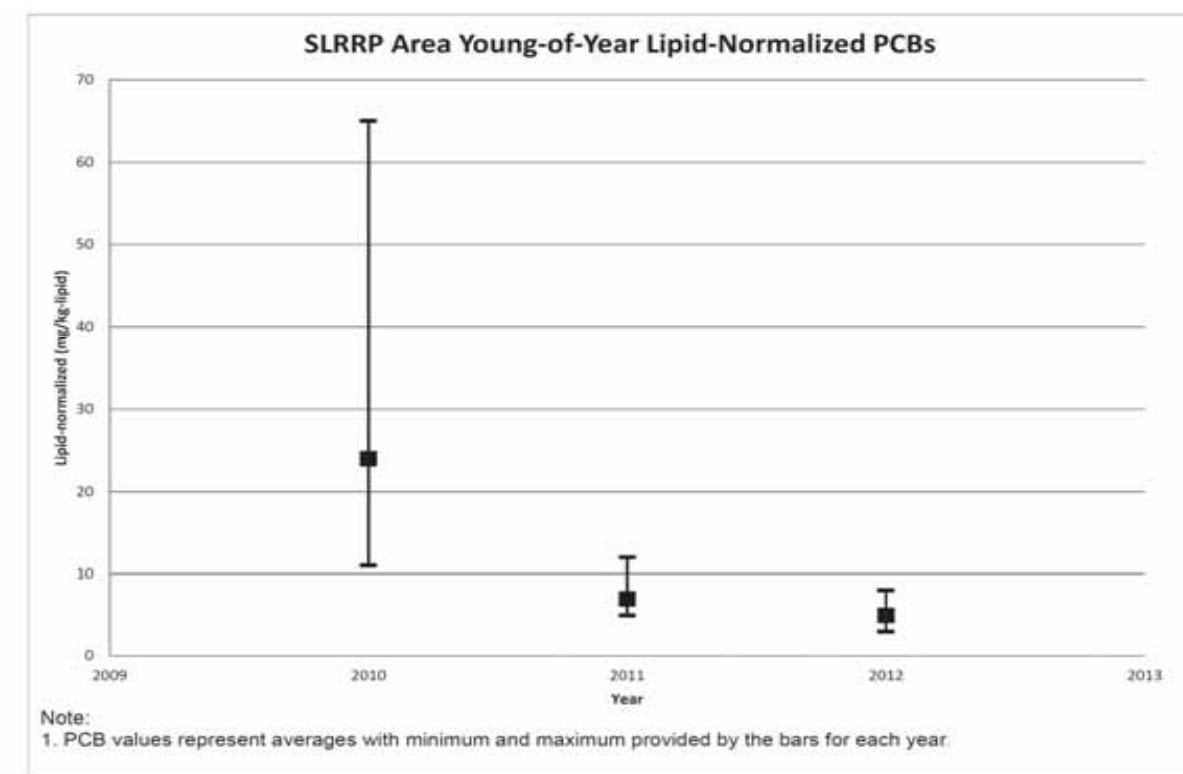
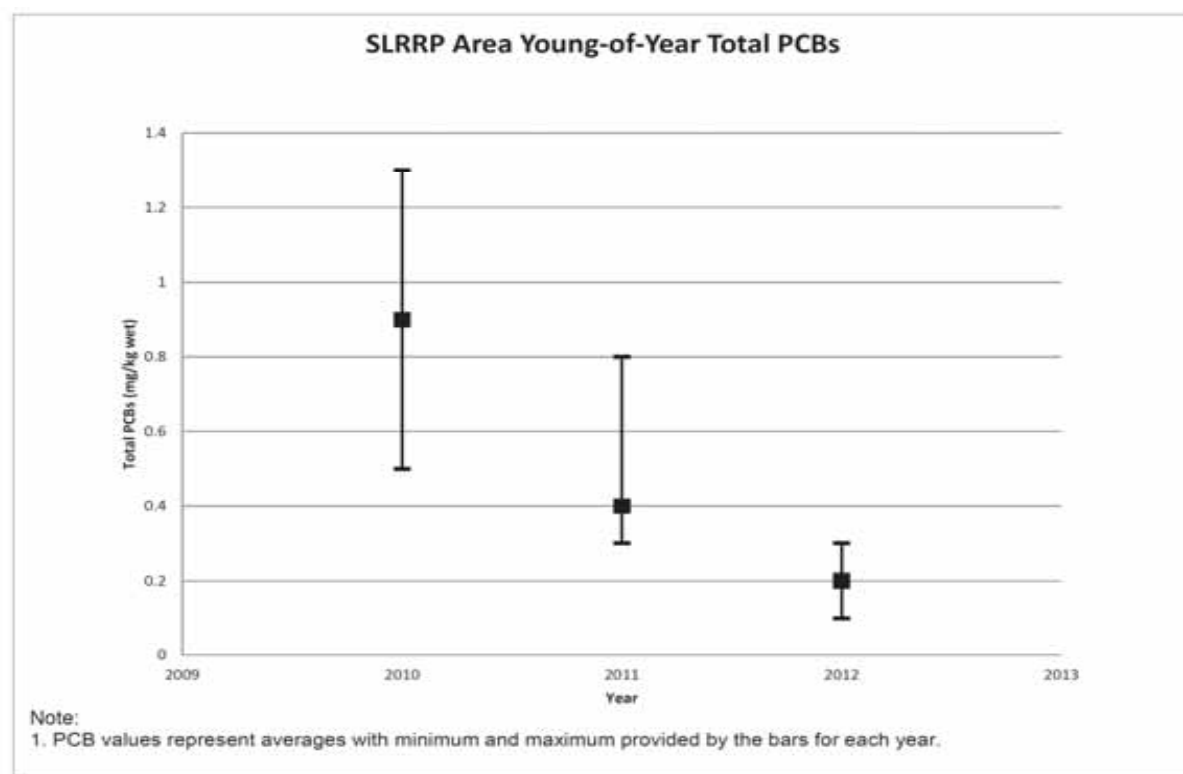
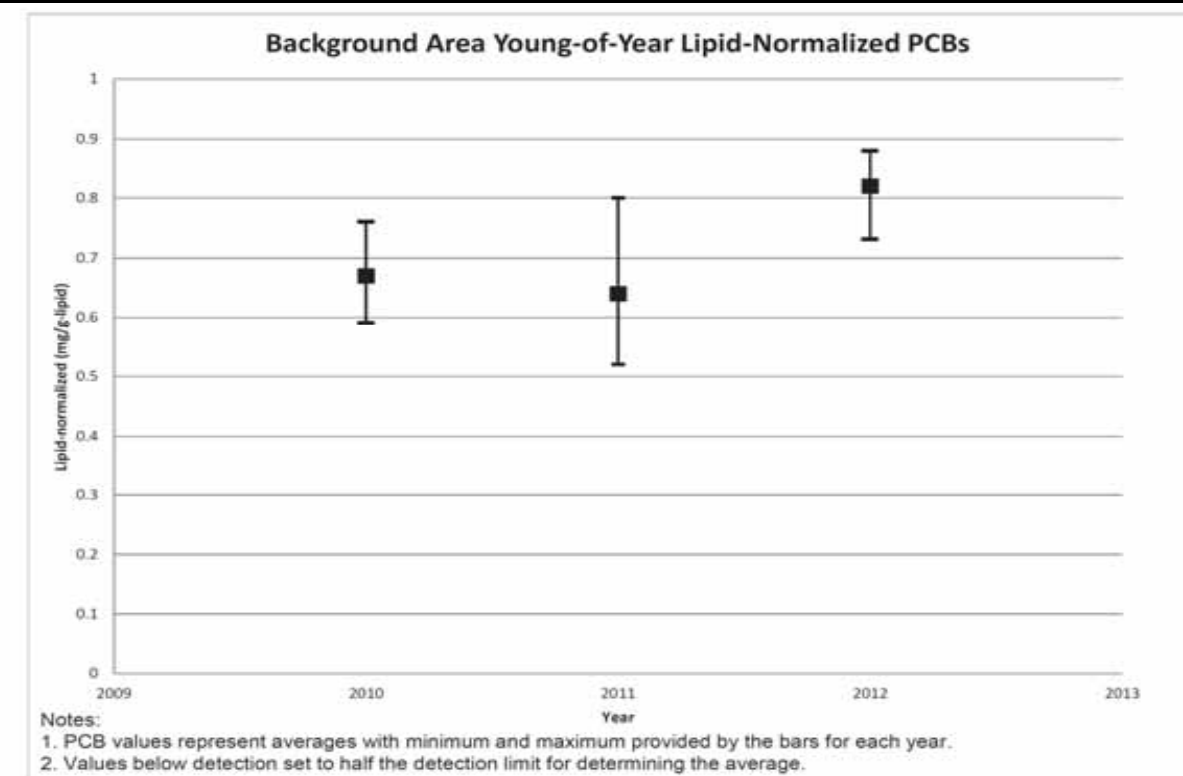
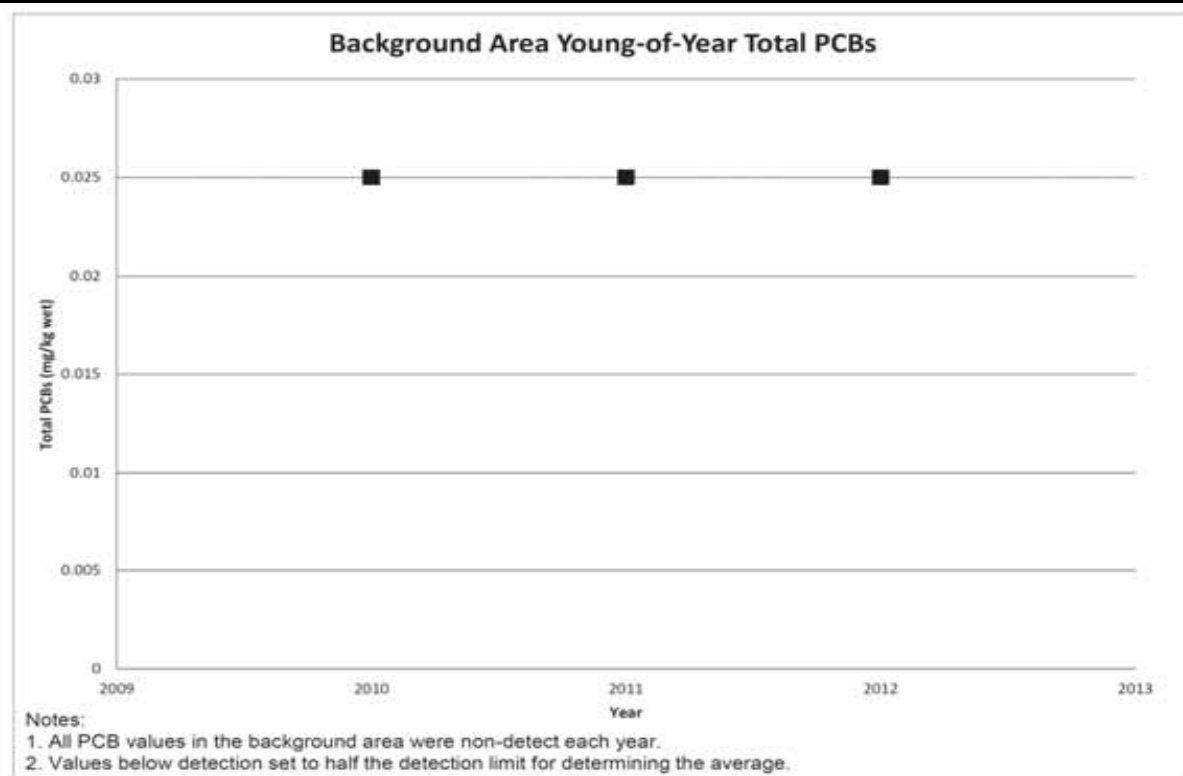
FIGURE 2-4

ALCOA EAST PLANT

ST. LAWRENCE RIVER

GRASSE RIVER

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ST. LAWRENCE RIVER REMEDIATION PROJECT
 MASSENA, NEW YORK

Young-of-Year PCB Results



FIGURE
2-5

APPENDIX A
PHYSICAL CONDITION CAP
MONITORING UNDERWATER VIDEO
SURVEY

See attached DVD

APPENDIX B

DATA VALIDATION REPORT

DATA COMPLETENESS CHECKLIST (EPA STAGE 1)

Project: Alcoa – St Lawrence River - 2012 **Date:** February 11, 2013
Project No.: 120002-08.01 **Laboratory:** NEA/Pace

SDGs:

12090203	12090204	12090233 /10209245	12100234	12100194 / 10210905	12110018
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Analysis and Method:

- Polychlorinated biphenyls (PCBs) by USEPA method 8082
- Lipids by NEA/Pace standard operating procedure (SOP) NE 158_05
- Polychlorodibenzofurans (PCDFs) by a modified USEPA method 8290

Sample ID	Lab Sample ID	Matrix	Parameters
FS7-1197-SB	12090203-08	Fish Tissue	PCBs, Lipids
FS7-1198-SB	12090203-09	Fish Tissue	PCBs, Lipids
FS7-1199-SB	12090203-10	Fish Tissue	PCBs, Lipids
FS7-1200-SB	12090203-11	Fish Tissue	PCBs, Lipids
FS7-1201-SB	12090203-12	Fish Tissue	PCBs, Lipids
FS7-1202-SB	12090203-13	Fish Tissue	PCBs, Lipids
FS7-1203-BB	12090203-14	Fish Tissue	PCBs, Lipids
FS7-1204-BB	12090204-01	Fish Tissue	PCBs, Lipids
FS7-1205-BB	12090204-02	Fish Tissue	PCBs, Lipids
FS7-1206-BB	12090204-03	Fish Tissue	PCBs, Lipids
FS7-1207-BB	12090204-04	Fish Tissue	PCBs, Lipids
FS7-1208-BB	12090204-05	Fish Tissue	PCBs, Lipids
FS8-1243-SS	12090233-01	Fish Tissue	PCBs, Lipids
FS8-1244-SS	12090233-02	Fish Tissue	PCBs, Lipids
FS8-1245-SS	12090233-03	Fish Tissue	PCBs, Lipids
FS8-1246-SS	12090233-04	Fish Tissue	PCBs, Lipids
FS8-1247-SS	12090233-05	Fish Tissue	PCBs, Lipids
	10209245001	Fish Tissue	Furans
FS7-1256-SS	12100194-01	Fish Tissue	PCBs, lipids
	10210905001	Fish Tissue	Furans
FS7-1257-SS	12100194-02	Fish Tissue	PCBs, lipids

Sample ID	Lab Sample ID	Matrix	Parameters
	10210905002	Fish Tissue	Furans
FS7-1258-SS	12100194-03	Fish Tissue	PCBs, lipids
	10210905003	Fish Tissue	Furans
FS7-1259-SS	12100194-04	Fish Tissue	PCBs, Lipids
FS7-1260-SS	12100194-05	Fish Tissue	PCBs, Lipids
FS7-1261-SS	12100194-06	Fish Tissue	PCBs, Lipids
FS7-1262-SS	12100194-07	Fish Tissue	PCBs, Lipids
FS7-1263-SS	12100194-08	Fish Tissue	PCBs, Lipids
FS7-1264-SS	12100194-09	Fish Tissue	PCBs, Lipids
FS7-1265-SS	12100194-10	Fish Tissue	PCBs, Lipids
FS9-1266-SB	12100194-11	Fish Tissue	PCBs, Lipids
FS9-1267-SB	12100194-12	Fish Tissue	PCBs, Lipids
FS9-1268-SB	12100194-13	Fish Tissue	PCBs, Lipids
FS9-1269-SB	12100194-14	Fish Tissue	PCBs, Lipids
FS9-1270-SB	12100194-15	Fish Tissue	PCBs, Lipids
FS9-1271-SB	12100194-16	Fish Tissue	PCBs, Lipids
FS9-1272-BB	12100194-17	Fish Tissue	PCBs, Lipids
FS9-1273-BB	12100194-18	Fish Tissue	PCBs, Lipids
FS9-1274-BB	12100194-19	Fish Tissue	PCBs, Lipids
FS9-1275-BB	12100194-20	Fish Tissue	PCBs, Lipids
FS9-1285-BB	12100234-01	Fish Tissue	PCBs, Lipids
FS8-1286-BB	12100234-02	Fish Tissue	PCBs, Lipids
FS8-1287-BB	12100234-03	Fish Tissue	PCBs, Lipids
FS8-1288-BB	12100234-04	Fish Tissue	PCBs, Lipids
FS8-1289-BB	12100234-05	Fish Tissue	PCBs, Lipids
FS8-1290-BB	12100234-06	Fish Tissue	PCBs, Lipids
FS8-1291-BB	12100234-07	Fish Tissue	PCBs, Lipids
FS8-1292-SB	12100234-08	Fish Tissue	PCBs, Lipids
FS8-1293-SB	12100234-09	Fish Tissue	PCBs, Lipids
FS8-1294-SB	12100234-10	Fish Tissue	PCBs, Lipids
FS8-1295-SB	12100234-11	Fish Tissue	PCBs, Lipids
FS8-1296-LB	12100234-12	Fish Tissue	PCBs, Lipids
FS8-1297-LB	12100234-13	Fish Tissue	PCBs, Lipids
FS9-1209-BB	12110018-01	Fish Tissue	PCBs, Lipids

Yes No N/A

☒ ☐ ☐ COCs filled out correctly?

☒ ☐ ☐ Sample IDs, collection dates and times, and date and time of lab receipt

documented?

☒ ☐ ☐ Sample receipt conditions documented?

☒ ☐ ☐ Requested analyses completed?

☒ ☐ ☐ Target analyte lists used and correct units reported?

☒ ☐ ☐ Target reporting limits used?

- Several PCB reporting limits for non-detected samples were slightly elevated due to a smaller sample size.

☒ ☐ ☐ Lab qualifiers defined?

☒ ☐ ☐ Requested methods used for sample handling, preparation, cleanup, and analyses?

☒ ☐ ☐ Associated analyses dates present?

☒ ☐ ☐ Holding times met (from sampling date to preparation and preparation to analysis)?

- SDG 12090233 Furans: Sample FS8-1247-SS was received outside of the method recommended 30-day hold time for USEPA 8290. However, hold times were removed for dioxin/furans in solids in the February 2007 Revision 4 to SW-846, Chapter 4; data are not expected to be affected.

☒ ☐ ☐ Method blanks analyzed at the required frequency?

☒ ☐ ☐ Method blanks free of target analytes?

☒ ☐ ☐ Laboratory control samples analyzed at required frequencies?

☒ ☐ ☐ Laboratory control sample recoveries within control limits?

☒ ☐ ☐ Surrogate or deuterated monitoring compounds (DMC) recoveries within control limits?

- SDGs 10210905 and 12090233 Furans: The percent recovery (%R) values for 1,2,3,4,7,8,9-HpCDF-13C and/or OCDD-13C in samples FS7-1256-SS, FS7-1257-SS, FS7-1258-SS, and FS8-1247-SS were
-

below the laboratory control limit. However, quantification is based on isotope dilution and data were automatically corrected for variation in recovery, so data are not expected to be affected.

☒ ☐ ☐ Matrix spike/matrix spike duplicate (MS/MSD) samples analyzed at the required frequencies?

☒ ☐ ☐ MS/MSD recoveries within control limits?

- SDG 12100234 Lipids: Although a matrix spike is not performed for lipid analysis, the relative percent difference (RPD) value for lipids analysis of the MS/MSD sample (FS9-1285-BB) was above the control limit. The lipid concentration in this sample may be estimated.

☐ ☐ ☒ Lab duplicates analyzed at required frequencies?

- No lab duplicates analyzed. Precision was assessed based on the MS/MSD RPDs.

☐ ☐ ☒ Duplicate results within control limits?

☐ ☐ ☒ Serial dilutions, post digestion spikes, and/or standard reference materials analyzed at required frequencies?

☐ ☐ ☒ Serial dilutions, post digestion spikes, and/or standard reference material results within control limits?

☐ ☐ ☒ Field and rinse blanks collected at required frequencies?

- No rinse blanks were required for this project.

☐ ☐ ☒ Field and rinse blanks free of target analytes?

☐ ☐ ☒ Field duplicates collected at required frequencies?

- No field duplicates were required for this project.

☐ ☐ ☒ Field duplicate results within control limits?

☐ ☒ ☐ Other issues?
